I Claim:

1. A radiation detection instrument comprising:

a mobile communications device having wireless means for communicating over a wireless communications network;

a radiation detector operably connected to said mobile communications device; and

means for analyzing data collected by the radiation detector and displaying said data via the mobile communications device.

2. The instrument of claim 1,

wherein said mobile communications device is a cellular phone.

3. The instrument of claim 1,

wherein said wireless means is adapted to communicate with a data server of a central monitoring system over the wireless communications network.

4. The instrument of claim 3,

wherein said wireless means is adapted to access the Internet using a web-based protocol for data transmission.

5. The instrument of claim 3,

wherein said wireless means is adapted to access the Internet using an always-on mobile Internet connection system.

6. The instrument of claim 3,

wherein said mobile communications device is adapted to automatically transmit the data in real time to the data server of the central monitoring system.

7. The instrument of claim 3,

wherein data is encrypted for transmission to the data server of the central monitoring system.

8. The instrument of claim 3,

wherein said radiation detector is adapted to measure the individual energies of detected photons.

9. The instrument of claim 8,

wherein data is transmitted by said mobile communications device to the data server of the central monitoring system in list mode to preserve full information content.

10. The instrument of claim 1,

further comprising a locator operably connected to said mobile communications device for determining the location of said instrument.

11. The instrument of claim 10,

wherein said locator is a coordinate locator based on an absolute coordinate system of location identification.

12. The instrument of claim 11,

wherein said coordinate locator is a GPS receiver.

13. The instrument of claim 10,

wherein the radiation detector is adapted to measure the individual energies of detected photons, and the locator determines the location of said instrument associated with each detected photon.

14. The instrument of claim 13,

further comprising a clock-calendar operably connected to said mobile communications device for determining the detection time-date associated with each detected photon.

15. The instrument of claim 14,

wherein said mobile communications device is adapted to transmit data of the individual photon energies and the corresponding detection time-date and

detection location associated with each to a data server of a central monitoring system.

16. The instrument of claim 1,

wherein said radiation detector comprises a room temperature-operable solid state semiconductor material for measuring gammy-ray photons and/or neutrons.

17. The instrument of claim 16,

wherein said radiation detector is formed from a material selected from a group consisting of cadmium zinc telluride, cadmium telluride, mercuric iodide, lead iodide and aluminum antimonide.

18. The instrument of claim 16,

wherein said radiation detector is pixelated.

19. The instrument of claim 18,

wherein pixels located in regions of the detector having imperfections are disabled to improve overall detector resolution.

20. The instrument of claim 16,

wherein the radiation detector material is of a commercial grade having low spectral resolution when operated as a single-crystal detector.

21. The instrument of claim 1,

wherein said radiation detector is interconnected to a low-power VLSI readout.

22. The instrument of claim 1,

wherein said means for analyzing and displaying data includes means for identifying isotopes from the detected photon energies.

23. The instrument of claim 22,

further comprising means for alerting a user upon isotope detection.

24. The instrument of claim 23,

wherein the means for alerting is adapted to be triggered when a predetermined level of radiation is detected.

25. The instrument of claim 24,

wherein the means for alerting is adapted not to be triggered when a benign isotope is identified, despite detection of the predetermined level of radiation,

26. A radiation detection instrument comprising:

a mobile communications device having wireless means for communicating with a data server of a central monitoring system over a wireless communications network;

a radiation detector operably connected to said mobile communications device for measuring the individual energies of detected photons;

a clock-calendar operably connected to said mobile communications device for determining the time-date associated with each detected photon; and

a locator operably connected to said mobile communications device for determining the location of said instrument associated with each detected photon,

wherein said mobile communications device is adapted to transmit data of the individual photon energies and the corresponding detection time-date and detection location associated with each to the data server of said central monitoring system.

27. The instrument of claim 26,

wherein said mobile communications device is a cellular phone.

28. The instrument of claim 26,

wherein the wireless means is adapted to access the Internet using a web-based protocol for data transmission.

29. The instrument of claim 26,

wherein said wireless means is adapted to access the Internet using an always-on mobile Internet connection system.

30. The instrument of claim 26,

wherein said mobile communications device is adapted to automatically transmit the data in real time to the data server of the central monitoring system.

31. The instrument of claim 26,

wherein data is transmitted by said mobile communications device in list mode to preserve full information content.

32. The instrument of claim 26,

wherein data is encrypted for transmission to the data server of the central monitoring system.

33. The instrument of claim 26,

wherein said locator is a coordinate locator based on an absolute coordinate system of location identification.

34. The instrument of claim 33,

wherein said coordinate locator is a GPS receiver.

35. The instrument of claim 26,

wherein said radiation detector comprises a room temperature-operable solid state semiconductor material for measuring gammy-ray photons and/or neutrons.

36. The instrument of claim 35,

wherein said radiation detector is formed from a material selected from a group consisting of cadmium zinc telluride, cadmium telluride, mercuric iodide, lead iodide and aluminum antimonide.

37. The instrument of claim 35,

wherein said radiation detector is pixelated.

38. The instrument of claim 37,

wherein pixels located in regions of the detector having imperfections are disabled to improve overall detector resolution.

39. The instrument of claim 35,

wherein the radiation detector material is of a commercial grade having low spectral resolution when operated as a single-crystal detector.

40. The instrument of claim 26,

wherein said radiation detector is interconnected to a low-power VLSI readout.

41. The instrument of claim 26,

further comprising means for identifying isotopes from the detected photon energies.

42. The instrument of claim 41,

further comprising means for alerting a user upon isotope detection.

43. The instrument of claim 42,

wherein the means for alerting is adapted to be triggered when a predetermined level of radiation is detected.

44. The instrument of claim 43,

wherein the means for alerting is adapted not to be triggered when a benign isotope is identified, despite detection of the predetermined level of radiation.

45. A radiation detection network, comprising:

a central monitoring system having a data server connected to a wireless communications network; and

a plurality of radiation detection instruments widely distributed in a geographic region, each instrument comprising: a mobile communications device having wireless means for communicating with the data server of the central monitoring system over the wireless communications network; a radiation detector operably connected to said mobile communications device for measuring the individual energies of detected photons; a clock-calendar operably connected to said mobile communications device for determining the time-date associated with each detected photon; and a locator operably connected to said mobile communications device for determining the location of said instrument associated with each detected photon, said mobile communications device adapted to transmit data of the individual photon energies and the corresponding detection time-dates and detection locations associated with each to the data server of said central monitoring system,

wherein said central monitoring system includes means for collectively analyzing said data received from the plurality of radiation detection instruments, whereby a radiation source(s) may be identified and/or tracked.

46. The network of claim 45,

wherein the mobile communications device of each instrument is a cellular phone.

47. The network of claim 45,

wherein the wireless means of each instrument is adapted to access the Internet using a web-based protocol for data transmission.

48. The network of claim 45,

wherein the wireless means of each instrument is adapted to access the Internet using an always-on mobile Internet connection system.

49. The network of claim 45,

wherein said mobile communications device of each instrument is adapted to automatically transmit the data in real time to the data server of the central monitoring system.

50. The network of claim 45,

wherein data is transmitted by said mobile communications device of each instrument to the data server of the central monitoring system in list mode to preserve full information content.

51. The network of claim 45,

wherein data is encrypted for transmission by each instrument to the data server of the central monitoring system.

52. The network of claim 45,

wherein said locator of each instrument is a coordinate locator based on an absolute coordinate system of location identification.

53. The network of claim 52,

wherein said coordinate locator is a GPS receiver.

54. The network of claim 45,

wherein said radiation detector of each instrument comprises a room temperature-operable solid state semiconductor material for measuring gamma-ray photons and/or neutrons.

55. The network of claim 54,

wherein said radiation detector of each instrument is formed from a material selected from a group consisting of cadmium zinc telluride, cadmium telluride, mercuric iodide, lead iodide and aluminum antimonide.

56. The network of claim 54,

wherein said radiation detector of each instrument is pixelated.

57. The network of claim 56,

wherein pixels located in regions of the detector having imperfections are disabled to improve overall detector resolution.

58. The network of claim 54,

wherein the radiation detector material is of a commercial grade having low spectral resolution when operated as a single-crystal detector.

59. The network of claim 45,

wherein said radiation detector of each instrument is interconnected to a low-power VLSI readout.

60. The network of claim 45,

wherein each instrument further comprises means for identifying isotopes from the detected photon energies.

61. The network of claim 60,

wherein each instrument further comprises means for alerting a user upon isotope detection.

62. The network of claim 61,

wherein for each instrument the means for alerting is adapted to be triggered when a predetermined level of radiation is detected.

63. The network of claim 62,

wherein for each instrument the means for alerting is adapted not to be triggered when a benign isotope is identified, despite detection of the predetermined level of radiation.

64. The network of claim 45,

wherein said means for collectively analyzing the radiation and location data looks for correlations and deviations from background radiation.

65. A method of regional radiation monitoring comprising the steps of:

widely distributing a plurality of radiation detection instruments in a region, with each instrument comprising a mobile communications device having wireless means for communicating over a wireless communications network; a radiation detector operably connected to said mobile communications device for measuring the individual energies of detected photons; a clock-calendar operably connected to said mobile communications device for determining the time-date associated with each detected photon; and a locator operably connected to said mobile communications device for determining the location of said instrument associated with each detected photon,

on a data server of a central monitoring system connected to the wireless communications network: receiving data of the individual photon energies and the corresponding detection time-date and detection location associated with each from the plurality of radiation detection instruments in the region; and

collectively analyzing said received data whereby a radiation source(s) may be identified and/or tracked.

66. The method of claim 65,

wherein said collective analysis includes looking for correlations and deviations from background radiation.

67. The method of claim 65,

wherein said collective analysis produces a multi-dimensional map of the background radiation in the region, the energy dependence of the background radiation, and variations in background radiation as a function of associated detection parameters.

68. The method of claim 67,

wherein said associated detection parameters include detection time and detection location.

69. The method of claim 65,

wherein data is received from said instruments via the Internet using a web-based protocol for data transmission.

70. The method of claim 65,

wherein data is received from said instruments via the Internet using an always-on mobile Internet connection system.

71. The method of claim 65,

wherein data is received in real time by the data server of the central monitoring system due to the automatic data transmission from each instrument.

72. The method of claim 65,

wherein data is received in list mode to preserve full information content.

73. The method of claim 65,

wherein data is received encrypted.

74. The method of claim 65,

further comprising, upon receiving radiation data indicating a radiation source, utilizing said mobile communications device to communicate with users of said instruments to reconfigure the network.

75. The method of claim 65,

further comprising, upon receiving radiation data indicating a consequence management scenario, utilizing said mobile communications device to provide system-wide support to users of said instruments by coordinating and/or organizing consequence management efforts.